



TW500 Electric Actuator

Suitable for valve stroke $\leq 20\text{mm}$, nominal output force 500N

Features Introduction

RS485 Remote Control

The actuator is equipped with RS485 communication interface. The valve can be remotely controlled by ModBus protocol.



Specialty Cellphone APP Near Field Communication

The actuator has NFC function which can not only control valve opening and closing by mobile NFC client, but also set a number of parameters. NFC function can still read actuator parameter even if the actuator is powered off on site.



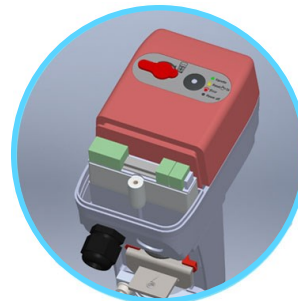
Self-stroking Function

The actuator has the self-stroking function. It can automatically measure the max. valve stroke.



Speed Adjustability

The speed can be switched through Dip switch.
High speed: 2s/mm
Low speed: 4s/mm



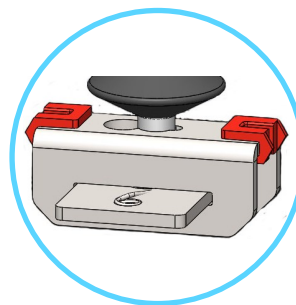
Manual Device

The actuator has the mechanical manual function and manual priority function, that is, the actuator will be automatically powered off when you insert the wrench, that is much safer.



Clamp plate connection

It adopts the seamless connection structure. It can ensure there is no gap during the movement of actuator and valve stem. And the operation is simple, saving the actuator and valve stem connecting time.



Type Summary

Type	Type Description	Rating Force	Stroke	Operating Voltage	Running Speed
TW500-XD24-S.10	Proportional/3-position type	500N	26mm	24VAC 24VDC	High speed: 2S/mm Low speed: 4S/mm
TW500-XD24-S485.10	RS485	500N	26mm	24VAC 24VDC	High speed: 2S/mm Low speed: 4S/mm

DIP Switch Instruction

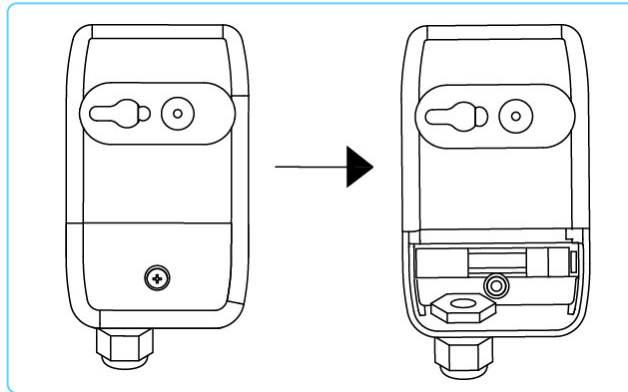
Switch	Function	Description
S1-1	Starting of control/ feedback signal	ON 4~20mA or 2~10VDC
		OFF 0~20mA or 0~10VDC
S1-2	Type of control signal	ON Current signal
		OFF Voltage signal
S1-3	Type of control signal	ON Voltage signal
		OFF Current signal
S1-4	Type of feedback signal	ON Current signal
		OFF Voltage signal
S1-5	Operating mode	ON When the control signal increases, actuator shaft extends; When the control signal decreases, actuator shaft retracts.
		OFF When the control signal increases, actuator shaft retracts; When the controls signal decreases, actuator shaft extends.
S1-6	Losing control signal mode	ON When control signal is voltage type or current type, actuator will provide a min. control signal internally.
		OFF 1) When control signal is voltage type, actuator will provide a max. control signal internally. 2) When control signal is current type, actuator will provide a min. control signal internally.
S1-7	Self-stroking mode	ON Power on each time, self-stroking starts automatically.
		OFF Self-stroking starts only when press the self-stroking button manually.
S1-8	Control type (when S1-9 is OFF)	ON 3-position type
		OFF Proportional type
S1-9	Control mode	ON RS485 interface control (ModBus protocol)
		OFF Proportional type and 3-position type
S1-10	Speed	ON High speed: 2S/mm
		OFF Low speed: 4S/mm

Wiring Instruction



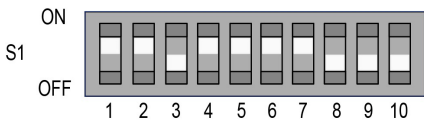
Notes:

1. Open the cover when wiring, prohibit to disassemble other spare parts!
2. Carefully check the power voltage when wiring, wire according to the product parameter, if not, it may cause fire and endanger personal safety in severe case!
3. Please cut off power supply during wiring in order to ensure personal safety!
4. After wiring, please install the cover to the original position to avoid electric shock!

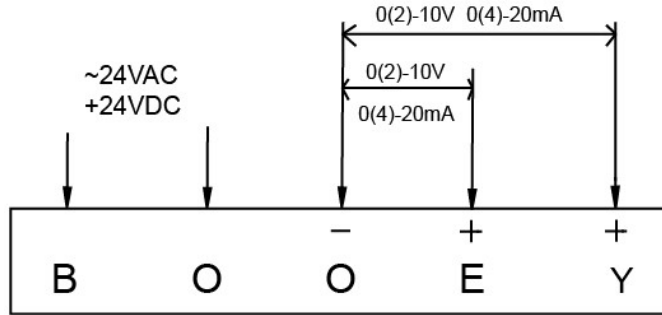
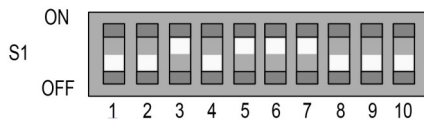


Function Introduction

TW500-XD24-S.10 Proportional type
Control signal: 4~20mA



Control signal: 0~10VDC



When TW...is proportional type, terminal B, O is power input, actuator can be controlled by connecting terminal O, E as shown above, when equipped with TPL series valve, DIP Switch S1-5 is DA mode:

Control signal at terminal O, E increasing: actuator shaft extends, valve stem retracts, valve tends to open;

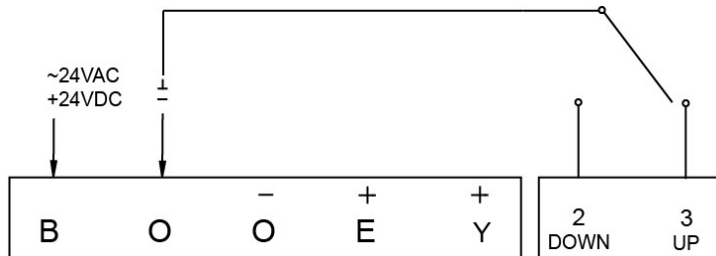
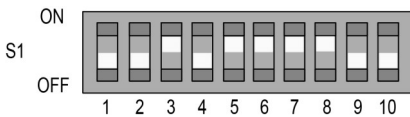
Control signal at terminal O, E decreasing: actuator shaft retracts, valve stem extends, valve tends to close;

Control signal at terminal O, E has no changing: actuator shaft and valve stem stay in present position;

When voltage (or current) signal is disconnected, this is equivalent to input a min. control signal, actuator shaft extends, valve closed.

TW500-XD24-S.10 3-position Type

The terminal O, E, Y doesn't work



When TW...is 3-position type, terminal B, O is power input, controls the actuator by the switch O, UP, DOWN

O, UP connected: actuator shaft retracts, and valve stem extends

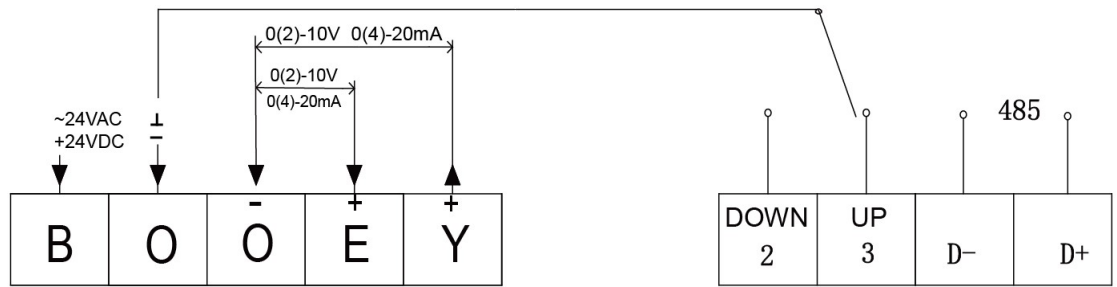
O, DOWN connected: actuator shaft extends, and valve stem retracts

Notes: terminal E, Y doesn't work by this time!

Function Introduction

TW500-XD24-S485.10

With RS485 communication function

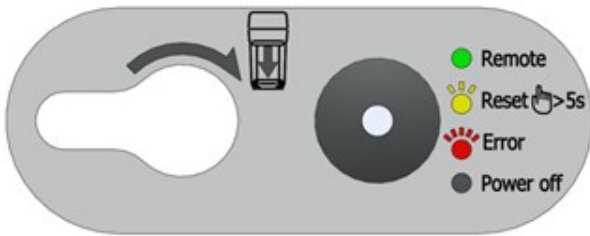


When TW... is RS485 bus communication, terminal B, O is power input, remote control by terminal 8, 9:

Actuator can be controlled remotely by RS485 bus communication, actuator supports ModBus protocol.

Notes: Terminal O, E, Y, UP, DOWN doesn't work by this time!

Indicating Light



Light	Status	Description
Green	Always	Normal mode
Red	Flashing	Alarming
Yellow	Flashing	Self-stroking

Debugging Instruction

- Connect actuator and valve body, wiring according to wiring diagram.
- Automatic self-stroking (factory default setting) : actuator will repeat automatic self-stroking when power on each time, the process is as follows:
 - The Reset yellow indicating light will keep flashing (1Hz), actuator shaft extends to lower limit position firstly and then, it retracts to upper limit position, actuator will not be controlled by signal by this time.
 - Reset yellow light stop flashing, self-stroking stops. By then, actuator running direction can be controlled by control signal.
 - If the Reset red light is quick flashing(2Hz) during the self-stroking, it means the self-stroking status is no correct and the actuator start alarming. The actuator can not match with the valve's max. stroke.

Remarks: If you don't need automatic self-stroking function, you can set the 7th switch to OFF, it will change into manual self-stroking.

C. Manual self-stroking function: If self-stroking is need in a power-on state, press down the Reset button over 5 seconds, and then the actuator start self-stroking. The phenomenon is the same as step B.

D. RS485 function:

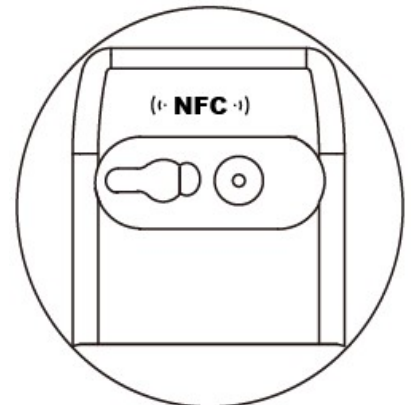
RS485 adopt standard Modbus protocol, the following parameters can be set through NFC:

- RS485 address: the default address is 1.
- Band rate: 2400/4800/9600(Default) /19200
- Byte format: 8bit Data Bits, No Parity (Default)/odd check/even check, 1 stop bit

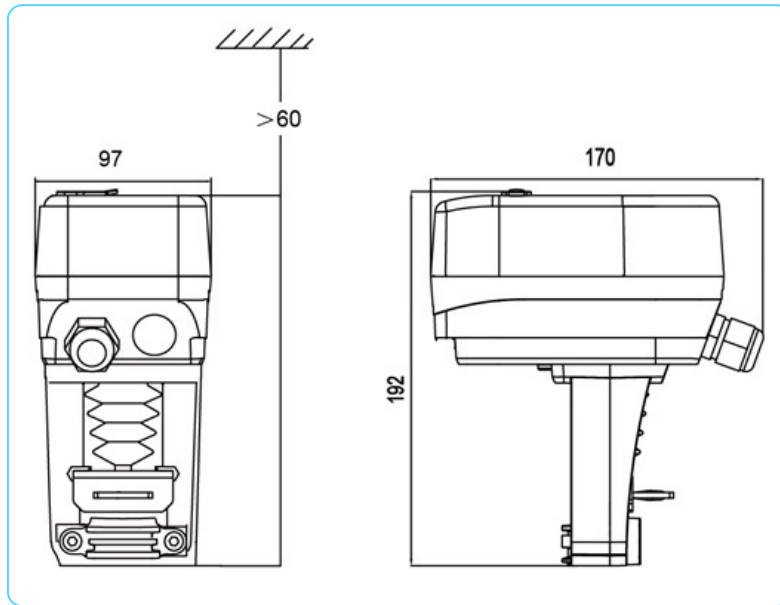
E. Specialty Cellphone APP: Open the mobile NFC client and close to the actuator NFC scanning area, as shown on the right. After connected, it can set the actuator parameters.

Notes:

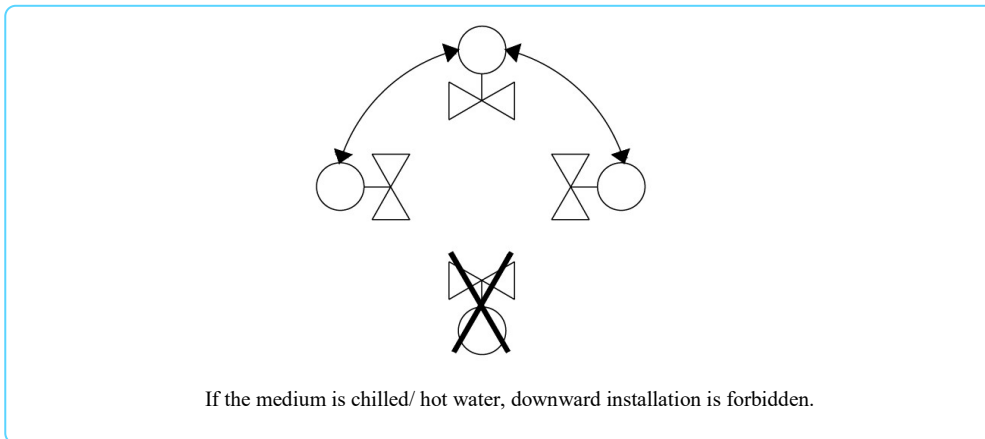
- Current type actuator can't set signal division, please use the function after setting voltage type.
- The factory default of winter and summer mode conversion function is close state, When using the function, actuator must in a power on state.



Dimension Figure



Installation Orientation



Installation Diagram

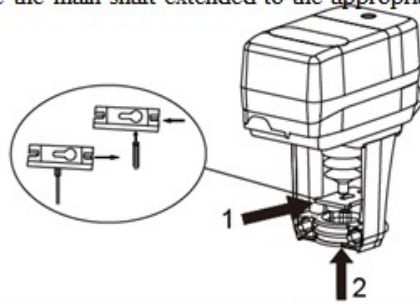


- Notes: 1. Prohibit installing outdoor to avoid PCB damage due to the condensation and water
 2. Rain cover and heating belt are necessary in case install outdoor

Item	Type	Description
Rain cover	TRAIN-1	To prevent the actuator from rain
Heating belt	THOT-3	To prevent condensation inside, the heating belt is built-in before delivery

Installation Diagram

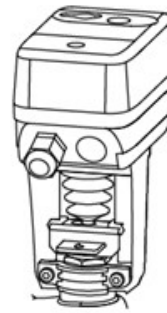
1 Press and hold the card along the arrow 1 direction, main shaft through the card from the arrow 2 direction, once the main shaft extended to the appropriate position, loosen the card and fixed the main shaft.



2 Put the slider into the actuator groove and lock it with two screws



3 The status after correctly assembly.



Manual Device Operation

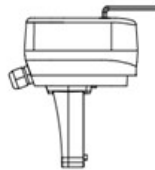


Notes:

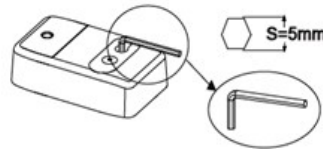
In the case of power off, the actuator needs self-stroking again after the manual operation is completed.

Manual self-stroking method: press the Reset button on the actuator cover over 5s, actuator will enter self-stroking.

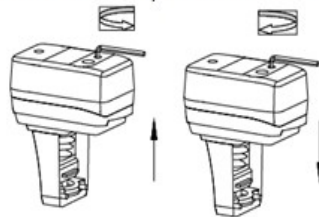
1. Shut off and prepare for manual operation



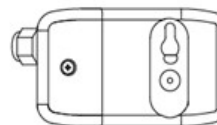
2. Insert the Allen wrench into the manual hole on the top of the cover.



3. Turn the Allen wrench anticlockwise, the actuator shaft retracts; Turn it clockwise, the actuator shaft extends.



4. Manual operation is done, take out the wrench and cover tightly the red plug.



Technical Parameters

Spare Parts Material

Cover	PC
Bracket	Aluminum die casting
Main Shaft Material	Stainless steel
Anti-rotation Plate	Stainless steel 304

Environment Parameter

Protection Level	IP54
Humidity	≤95% RH
Working Temperature	-25°C-65°C
Storage Temperature	-40°C-65°C

Operating parameter

Operating voltage TW500-XD24	24VAC ± 15%, 24VDC ± 15%
Frequency	50Hz/60Hz
Power consumption TW500-XD24	24VAC ≤ 6VA (Recommended AC Transformer: 15VA) 24VDC ≤ 4VA (Recommended DC Power supply: 10VA)
Speed TW500-XD24	High speed: 2S/mm Low speed: 4S/mm
Sensitivity	Proportional type: 0.8% RS485: 0.2%
Dead Zone	2%
Impedance (only for proportional type) Voltage input impedance Current input impedance	> 100K < 0.15K
Load requirement (only for proportional type) voltage output load requirement current output load requirement	> 2K < 0.5K
Control signal TW500-XD24	0(2) - 10V, 0(4) - 20mA
Feedback signal TW500-XD24	0(2) - 10V, 0(4) - 20mA
Life cycles	100 thousand cycles
Weight	1Kg

RS485 Communication Function (Optional)



RS485 communication: there is RS485 communication interface on the PCB

RS485 Communication can set the actuator control mode: Remote (Modbus) control, local control

1. It can control the actuator opening remotely
2. It can read the valve position feedback value remotely
3. It can read the actuator operating status remotely
4. It can set the actuator running speed, dead zone and so on remotely

Specialty Cellphone APP Near Field Communication (Optional)



Specialty Cellphone APP Near Field Communication supports the actuator's parameter reading and setting without the electricity supply.

Open the mobile NFC client and close to the actuator NFC scanning area. After connected, it can set the actuator parameters.

As show on the left, the APP client mainly contains the Actuator basic parameters, Actuator configuration parameters and Advanced function, the functions of each part is shown as below:

Actuator basic parameters: the actuator feedback and valve stroke can be read.

Actuator configuration parameters: the actuator curve type, address, opening range, dead zone, sensitivity can be set.

Advanced functions: it contains signal division and conversion function and so on.

Notes:

1. Current type actuator can't set signal division, please use the function after setting voltage type.
2. The default address is 1.

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